

ASSEMBLY MANUAL



BOOMERANG EP ARF TRAINER KIT

MS: 211

“ Graphics and specifications may change without notice “ .



**ALMOST
READY TO FLY**

Specifications:

Wingspan-----56.0 in (142.2 cm).
Wing area-----263.5sq.in (17.0 sq.dm).
Weight-----4.4 - 4.8 lbs (2.0 - 2.2 kg).
Length-----41.2 in (104.7cm).
Electric Power 32.....
Speed control 50A.....
(APC) 11x6 EP.....
Radio-----4 channels with 4 servos.
Flying skill level intermediate/ advanced

INTRODUCTION.

Thank you for choosing the **BOOMERANG EP ARTF** by **SEAGULL MODELS COMPANY LTD.**. This was designed with the intermediate/advanced sport flyer in mind. It is a semi scale airplane which is easy to fly and quick to assemble. The airframe is conventionally built using balsa, plywood to make it stronger than the average ARTF, yet the design allows the aeroplane to be kept light. You will find that most of the work has been done for you already. The motor mount has been fitted and the hinges are pre-installed. Flying the **BOOMERANG EP** is simply a joy.

This instruction manual is designed to help you build a great flying aeroplane. Please read this manual thoroughly before starting assembly of your **BOOMERANG EP**. Use the parts listing below to identify all parts.

WARNING.

Please be aware that this aeroplane is not a toy and if assembled or used incorrectly it is capable of causing injury to people or property. WHEN YOU FLY THIS AEROPLANE YOU ASSUME ALL RISK & RESPONSIBILITY.

If you are inexperienced with basic R/C flight we strongly recommend you contact your R/C supplier and join your local R/C model Flying Club. R/C Model Flying Clubs offer a variety of training procedures designed to help the new pilot on his way to successful R/C flight. They will also be able to advise on any insurance and safety regulations that may apply.

ADDITIONAL ITEMS REQUIRED.

- .40-.46 2-stroke engine.
- 4 channels radio with four servos.
- Glow plug to suit engine.
- Propeller to suit engine.
- Protective foam rubber for radio system.
- Silicone fuel line.
- Stick-on weights for balance

TOOLS AND SUPPLIES.

- Thick cyanoacrylate glue.
- 30 minute epoxy.
- 5 minute epoxy.
- Hand or electric drill.
- Assorted drill bits.
- Modelling knife.
- Straight edge ruler.
- 2mm ball driver.
- Phillips head screwdriver.
- 220 grit sandpaper.
- 90° square or builder's triangle.
- Wire cutters.
- Masking tape & T-pins.
- Thread-lock.
- Paper towels.

KIT CONTAIN.

FUSELAGE ASSEMBLY

- (1) Fuselage.
- (1) Pre-installed throttle pushrod & tube.
- (1) Pre-installed servo tray.
- (1) Pre-installed motor mount.
- (1) Pre-installed rudder pushrod.
- (1) Pre-installed elevator pushrod.

WING ASSEMBLY

- (1) Right wing half with preinstalled aileron.
- (1) Left wing half with pre-installed aileron.
- (1) Aluminium wing tube.
- (1) Covering strip for centresection joint.

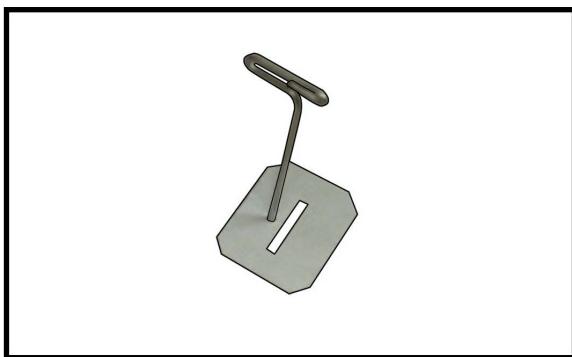
TAIL SECTION ASSEMBLY

- (1) Vertical stabilizer with preinstalled rudder.
- (1) Horizontal stabilizer with preinstalled elevator halves

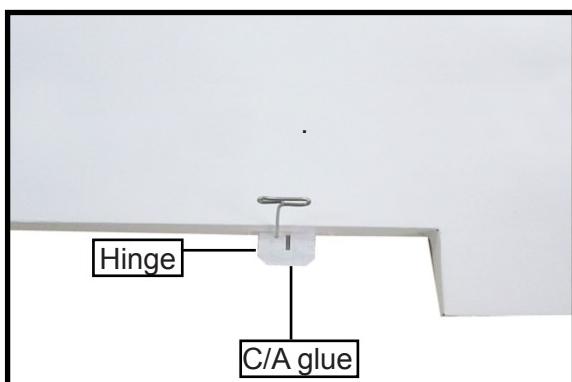
HINGING THE AILERON.

Note : The control surfaces, including the ailerons, elevators, and rudder, are pre-hinged with hinges in stalled, but the hinges are not glued in place. It is imperative that you properly adhere the hinges in place per the steps that follow using a high-quality thin C/A glue.

- 1) Carefully remove the aileron from one of the wing panels. Note the position of the hinges.



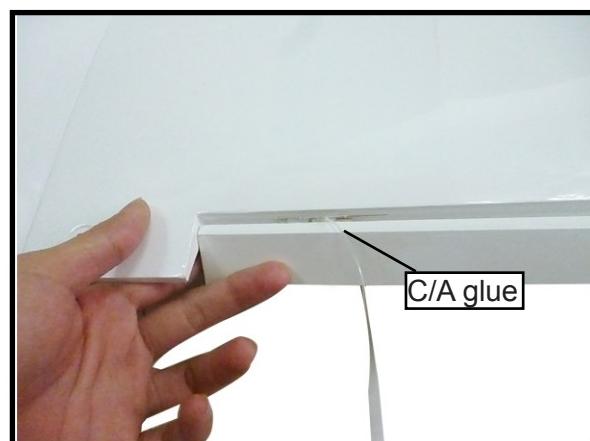
- 2) Remove each hinge from the wing panel and aileron and place a T-pin in the center of each hinge. Slide each hinge into the aileron until the T-pin is snug against the aileron. This will help ensure an equal amount of hinge is on either side of the hinge line when the aileron is mounted to the wing panel.

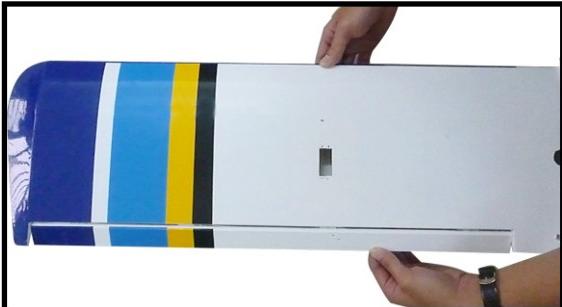


- 3) Slide the aileron on the wing panel until there is only a slight gap. The hinge is now centered on the wing panel and aileron. Remove the T-pins and snug the aileron against the wing panel. A gap of 1/64" or less should be maintained between the wing panel and aileron.

4) Deflect the aileron and completely saturate each hinge with thin C/A glue. The aileron's front surface should lightly contact the wing during this procedure. Ideally, when the hinges are glued in place, a 1/64" gap or less will be maintained throughout the length of the aileron to the wing panel hinge line.

Note : The hinge is constructed of a special material that allows the C/A to wick or penetrate and distribute throughout the hinge, securely bonding it to the wood structure of the wing panel and aileron.





- 5) Turn the wing panel over and deflect the aileron in the opposite direction from the opposite side. Apply thin C/A glue to each hinge, making sure that the C/A penetrates into both the aileron and wing panel.
- 6) Using C/A remover/debonder and a paper towel, remove any excess C/A glue that may have accumulated on the wing or in the aileron hinge area.
- 7) Repeat this process with the other wing panel, securely hinging the aileron in place.
- 8) After both ailerons are securely hinged, firmly grasp the wing panel and aileron to make sure the hinges are securely glued and cannot be pulled out. Do this by carefully applying medium pressure, trying to separate the aileron from the wing panel. Use caution not to crush the wing structure.



Note : Work the aileron up and down several times to “work in” the hinges and check for proper movement.

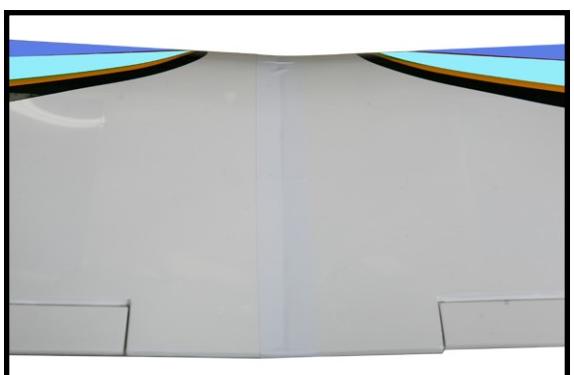
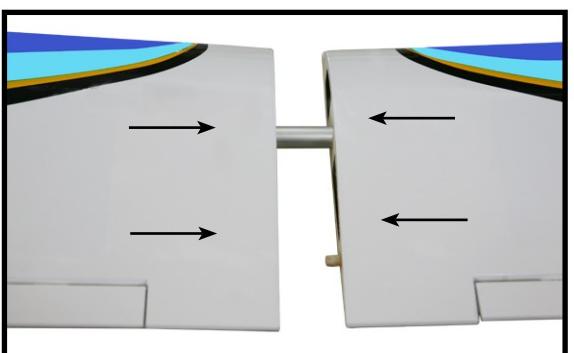
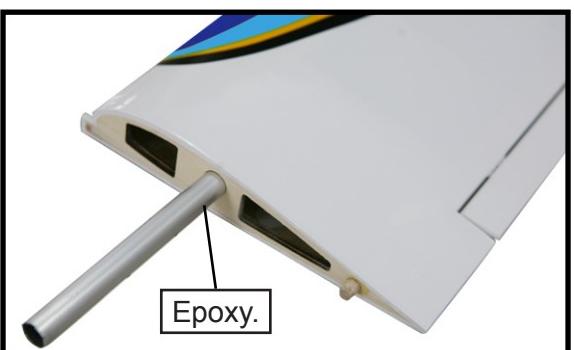
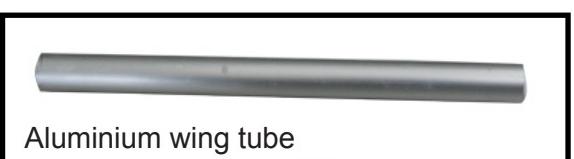
HINGING THE RUDDER.

Glue the rudder hinges in place using the same techniques used to hinge the ailerons.



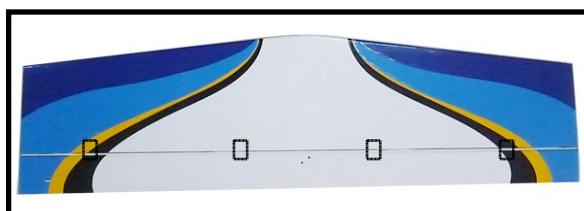
WING ASSEMBLY.

See below pictures.

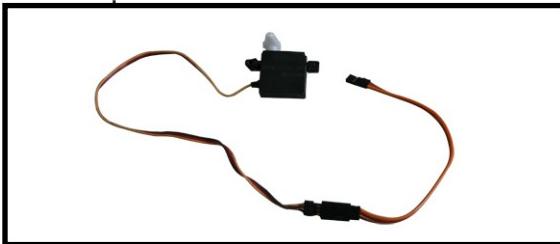


HINGING THE ELEVATOR.

Glue the elevator hinges in place using the same techniques used to hinge the ailerons.



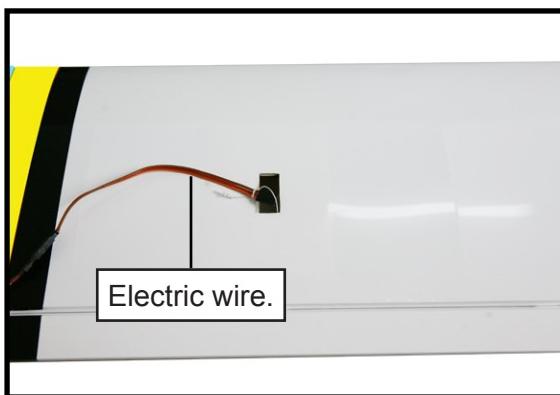
INSTALLING THE AILERON SERVO.



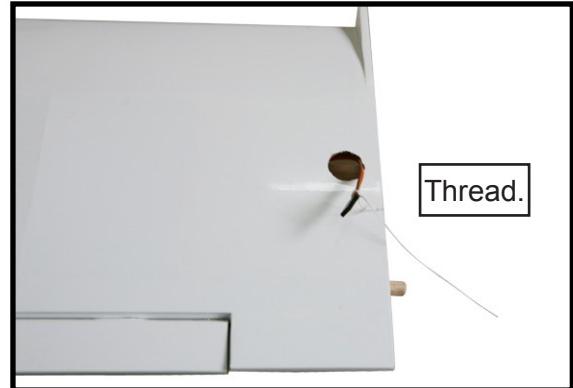
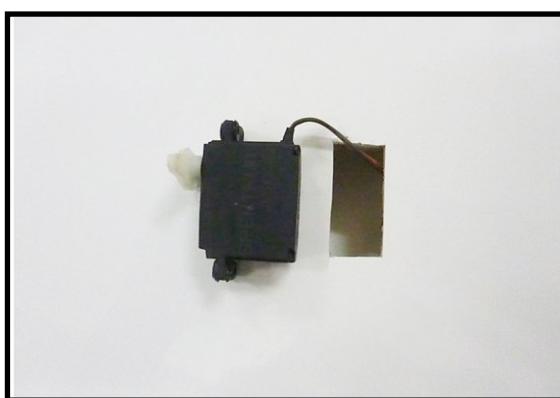
- 1) Install the rubber grommets and brass collets onto the aileron servo. Test fit the servo into the aileron servo mount.

⚠️ Because the size of servos differ, you may need to adjust the size of the precut opening in the mount. The notch in the sides of the mount allow the servo lead to pass through.

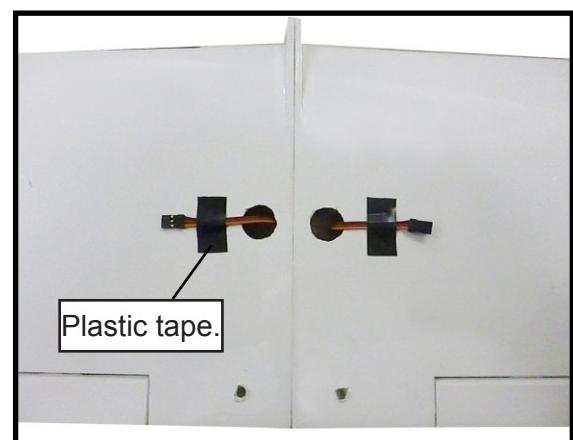
- 2) Using a small weight (Weighted fuel pick-up works well) and thread, feed the string through the wing as indicated.



- 3) Attach servo lead to the aileron servo. Attach the string to the servo lead and carefully thread it through the wing. Once you have threaded the lead through the wing, remove the string so it can be used for the other servo lead.



- 4) Tape the servo lead to the wing to prevent it from falling back into the wing.



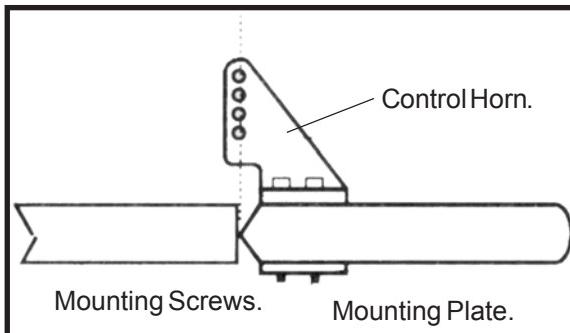
- 5) Reinstall the servo into the servo mount and secure the servo in place using the wood screws provided with your radio system.



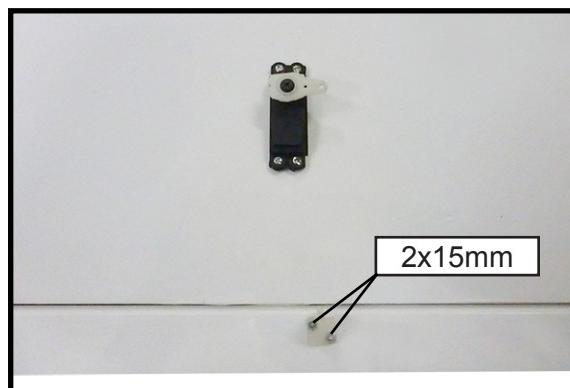
Repeat the procedure for the other wing half.

AILERON LINKAGE.

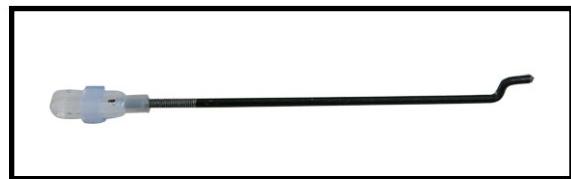
- 1) Using a ruler & pen to draw a straight line as below picture.
- 2) Locate the two nylon control horns, two nylon control horn backplates and four machine screws.
- 3) Position the aileron horn on the bottom side of aileron. The clevis attachment holes should be positioned over the hinge line.



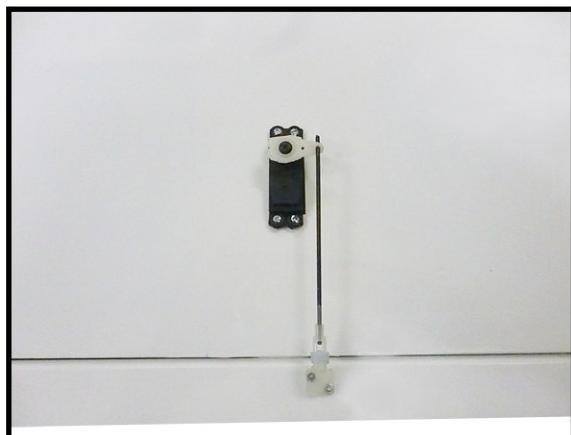
- 4) Using a 1mm drill bit and the control horns as a guide, drill the mounting holes through the aileron halves.
- 5) Mount the control horns by inserting the screws through the control horn bases and aileron halves, then into the mounting back-plates. Do not overtighten the screws or the backplates may crush the wood.
- 6) Thread one nylon adjustable control horn onto each aileron control rod. Thread the horns on until they are flush with the ends of the control rods.
- 7) With the aileron servo centered and the aileron even with the trailing edge of the wing attach the clevis to the control horn. Mark the control wire where it crosses the servo arm hole.



- 8) Make a 90-degree bend at the mark and cut off the excess wire leaving 10mm past the bend.

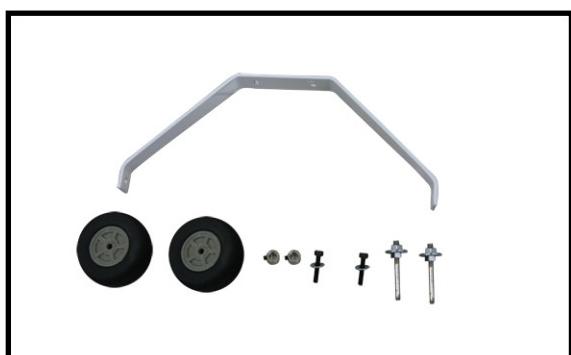


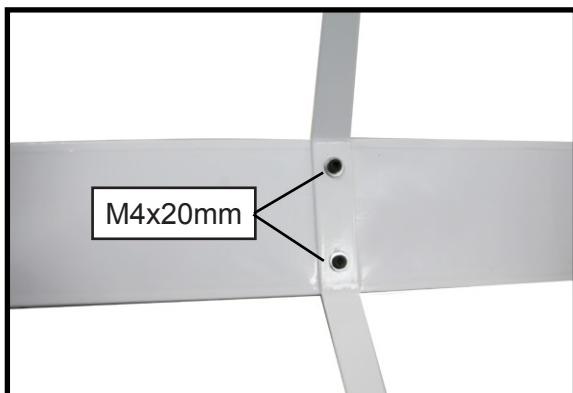
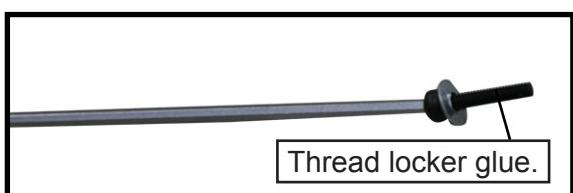
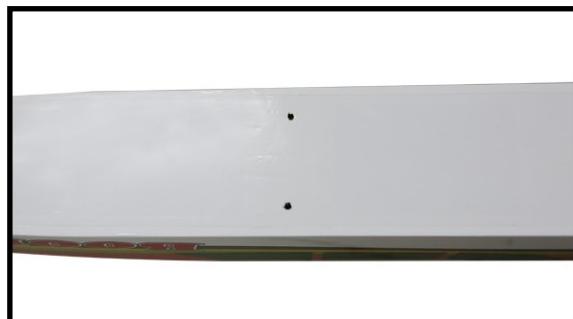
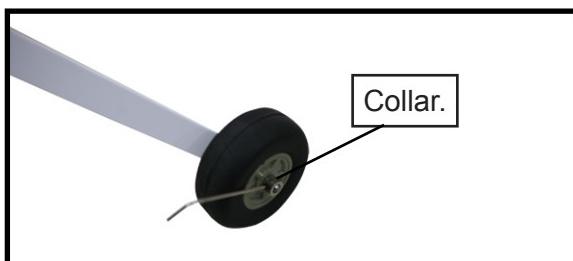
- 9) Connect the linkage as shown and secure the control wire with a wire keeper.



INSTALLING THE LANDING GEAR.

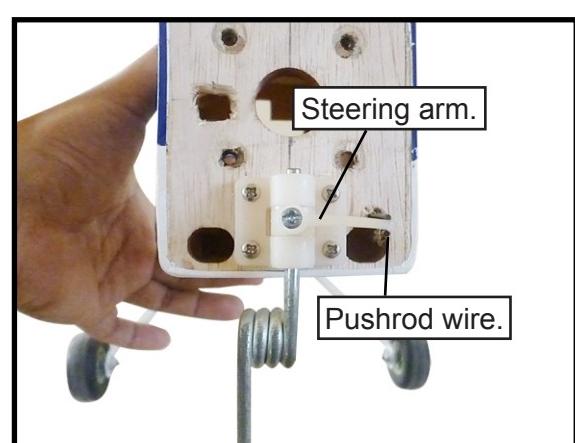
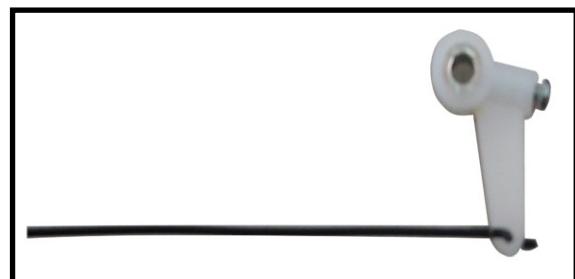
- 1) The blind nuts for securing the landing gear are already mounted inside the fuselage.
- 2) Using the hardware provided, mount the main landing gear to the fuselage.
- 3) Place the fuselage inverted on the work-bench in a suitable stand. Set the landing gear in place and use a screwdriver to secure the landing gear to the fuselage using bolts M4x20mm and washers. Make sure to use the threadlock on the bolts so they don't vibrate loose.





NOSE GEAR INSTALLATION.

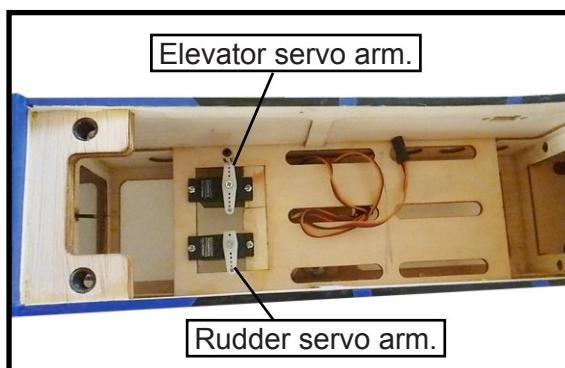
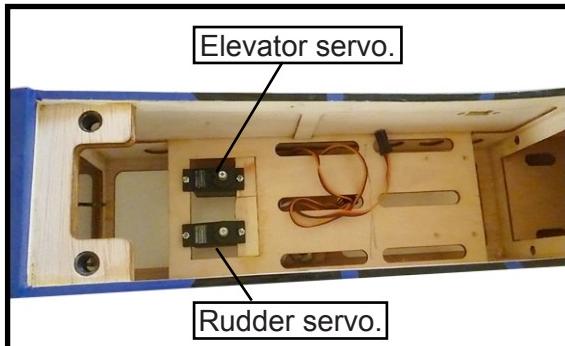
See below pictures.



INSTALLING THE FUSELAGE SERVOS.

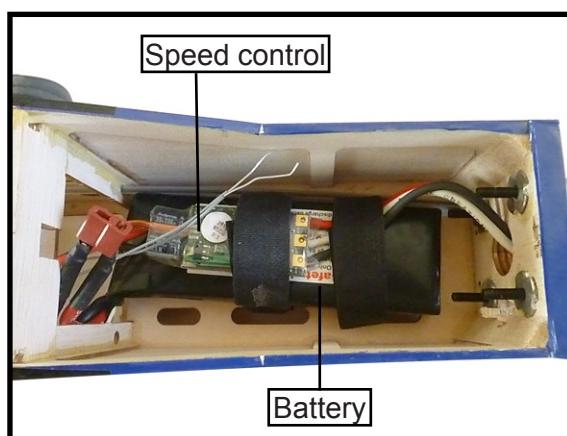
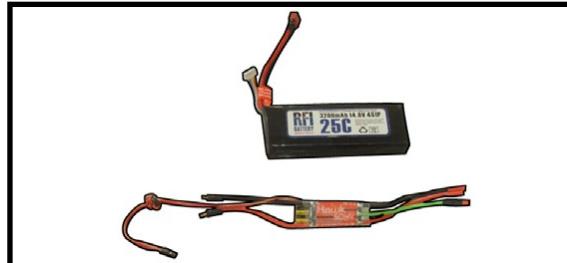
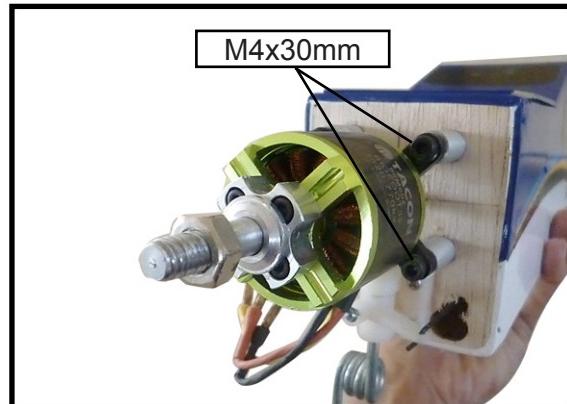
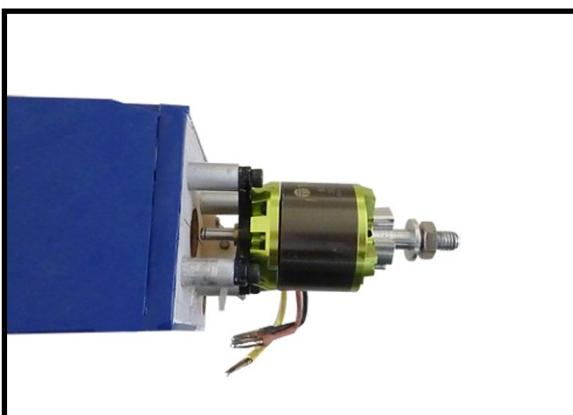
 Because the size of servos differ, you may need to adjust the size of the precut opening in the mount. The notch in the sides of the mount allow the servo lead to pass through.

- 1) Install the rubber grommets and brass collets onto the throttle servo. Test fit the servo into the aileron servo mount.
- 2) Secure the servos with the screws provided with your radio system.



ELECTRIC POWER CONVERSION.

- 1) Locate the items necessary to install the electric power conversion included with your model.

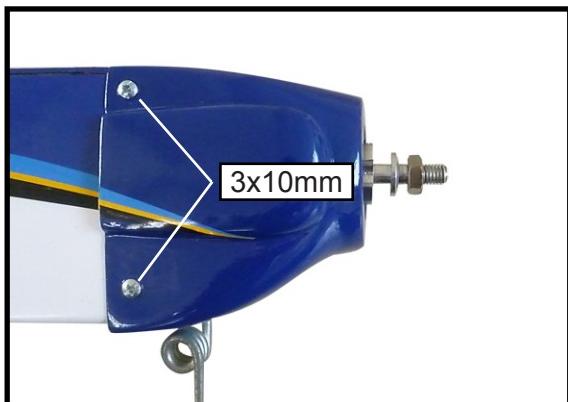


COWLING

- 1) Slide the fiberglass cowl over the motor and line up the back edge of the cowl with the marks you made on the fuselage then trim and cut as shown.



- 2) While keeping the back edge of the cowl flush with the marks, align the front of the cowl with the crankshaft of the engine. The front of the cowl should be positioned so the crankshaft is in nearly the middle of the cowl opening. Use the spinner backplate as a guide. Hold the cowl firmly in place using pieces of masking tape.



- 3) Install the muffler and muffler extension onto the engine and make the cutout in the cowl for muffler clearance. Connect the fuel and pressure lines to the carburetor, muffler and fuel filler valve. Secure the cowl to fuselage using the M3x10mm screws.



INSTALLING THE SPINNER.

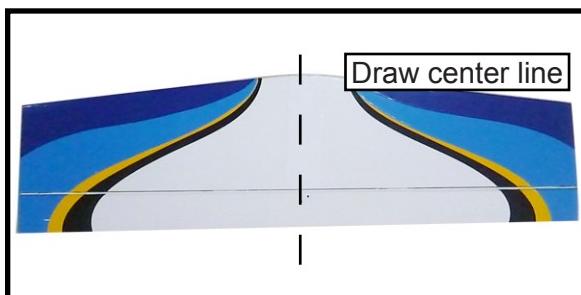
Install the spinner backplate, propeller and spinner cone.

 The propeller should not touch any part of the spinner cone. If it does, use a sharp modeling knife and carefully trim away the spinner cone where the propeller comes in contact with it.



HORIZONTAL STABILIZER.

1) Using a ruler and a pen, locate the center-line of the horizontal stabilizer, at the trailing edge, and place a mark. Use a triangle and extend this mark, from back to front, across the top of the stabilizer. Also extend this mark down the back of the trailing edge of the stabilizer.

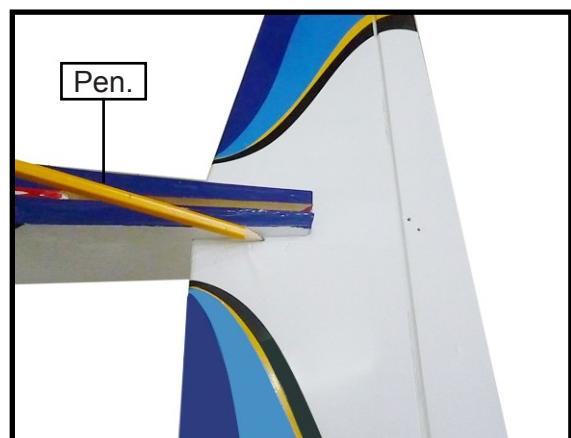


2) Using a modeling knife, carefully remove the covering from over the vertical stabilizer mounting slot in the top of the fuselage.

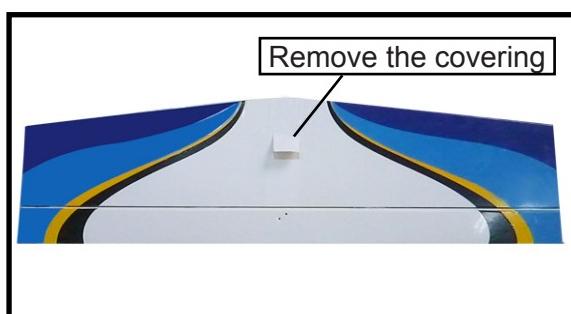
3) Slide the stabilizer into place in the precut slot in the rear of the fuselage. The stabilizer should be pushed firmly against the front of the slot.



4) With the stabilizer held firmly in place, use a pen and draw lines onto the stabilizer where it and the fuselage sides meet. Do this on both the right and left sides and top and bottom of the stabilizer.



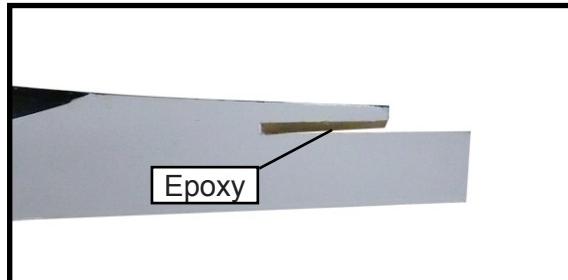
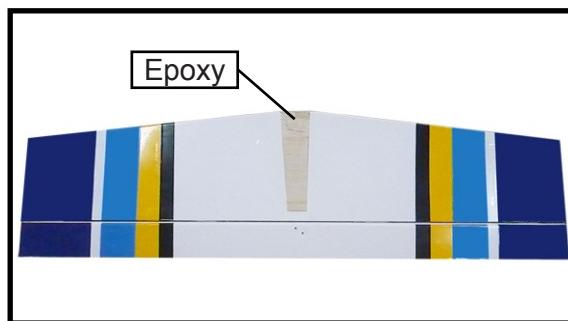
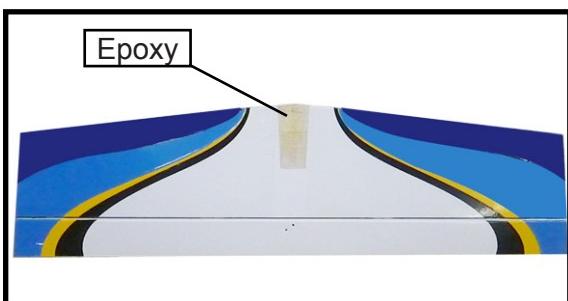
5) Remove the stabilizer. Using the lines you just drew as a guide, carefully remove the covering from between them using a modeling knife.



! When cutting through the covering to remove it, cut with only enough pressure to only cut through the covering itself. Cutting into the balsa structure may weaken it.

6) Using a modeling knife, carefully remove the covering that overlaps the stabilizer mounting platform sides in the fuselage. Remove the covering from both the top and the bottom of the platform sides.

7) When you are sure that everything is aligned correctly, mix up a generous amount of 30 Minute Epoxy. Apply a thin layer to the bottom of the stabilizer mounting area and to the stabilizer mounting platform sides in the fuselage. Putting the stabilizer in place and realign. Double check all of your measurements once more before the epoxy cures. Hold the stabilizer in place with T-pins or masking tape and remove any excess epoxy using a paper towel and rubbing alcohol.



10) After the epoxy has fully cured, remove the masking tape or T-pins used to hold the stabilizer in place. Carefully inspect the glue joints. Use more epoxy to fill in any gaps that may exist that were not filled previously and clean up the excess using a paper towel and rubbing alcohol.

VERTICAL STABILIZER INSTALLATION.

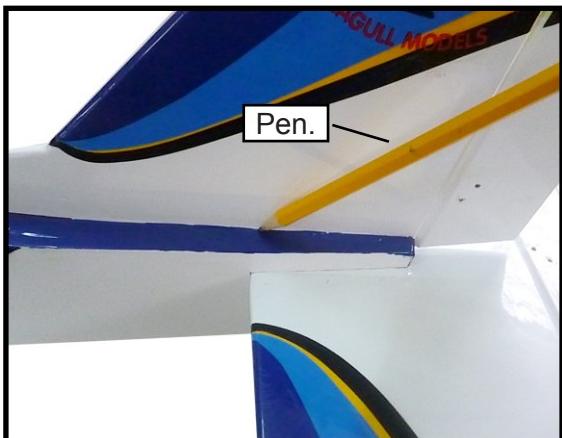


1) Using a modeling knife, remove the covering from over the precut hinge slot cut into the lower rear portion of the fuselage. This slot accepts the lower rudder hinge.

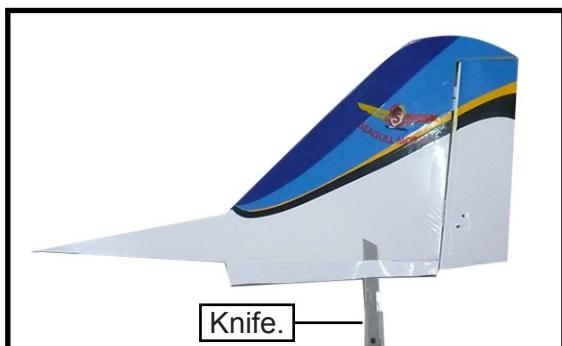
2) Slide the vertical stabilizer into the slot in the top of the fuselage. The rear edge of the stabilizer should be flush with the rear edge of the fuselage and the lower rudder hinge should engage the precut hinge slot in the lower fuselage. The bottom edge of the stabilizer should also be firmly pushed against the top of the horizontal stabilizer.



- 3) While holding the vertical stabilizer firmly in place, use a pen and draw a line on each side of the vertical stabilizer where it meets the top of the fuselage.

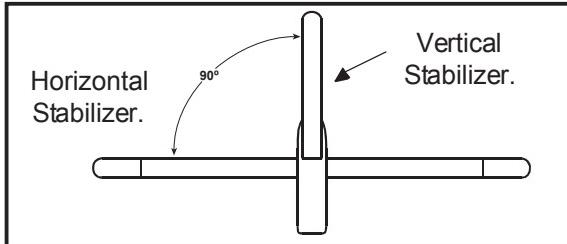


- 4) Remove the stabilizer. Using a modeling knife, remove the covering from below the lines you drew.



⚠ When cutting through the covering to remove it, cut with only enough pressure to only cut through the covering itself. Cutting into the balsa structure may weaken it.

- 5) Slide the vertical stabilizer back in place. Using a triangle, check to ensure that the vertical stabilizer is aligned 90° to the horizontal stabilizer.

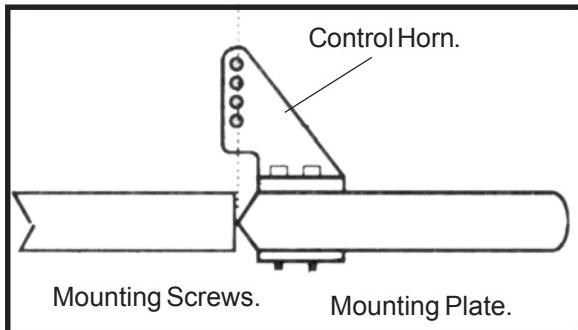


- 6) When you are sure that everything is aligned correctly, mix up a generous amount of 30 Minute Epoxy. Apply a thin layer to the mounting slot in the top of the fuselage and to the sides and bottom of the vertical stabilizer mounting area. Apply epoxy to the bottom and top edges of the filler block and to the lower hinge also. Set the stabilizer in place and realign. Double check all of your measurements once more before the epoxy cures. Hold the stabilizer in place with T-pins or masking tape and remove any excess epoxy using a paper towel and rubbing alcohol. Allow the epoxy to fully cure before proceeding.



CONTROL HORN INSTALLATION.

- 1) Locate the nylon control horns- nylon control horn backplates and machine screws.
- 2) The position of elevator control horn on the left side of elevator. The clevis attachment holes should be positioned over the hinge line.

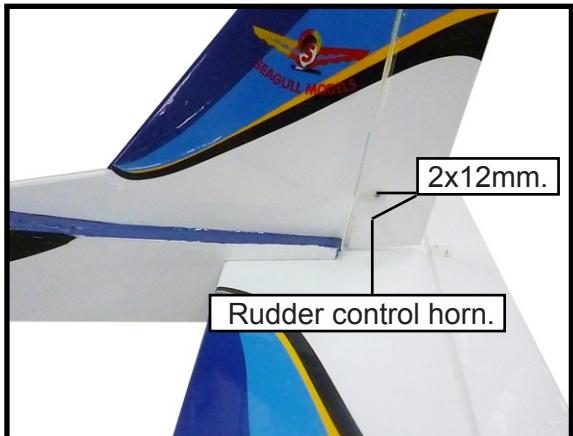
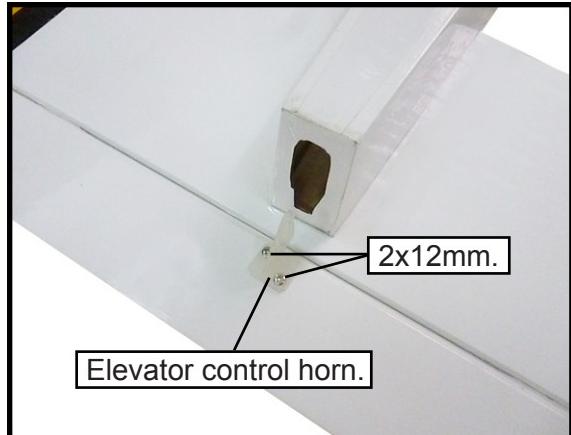


3) Using a 2mm drill bit and the control horns as a guide, drill the mounting holes through the elevator halves.

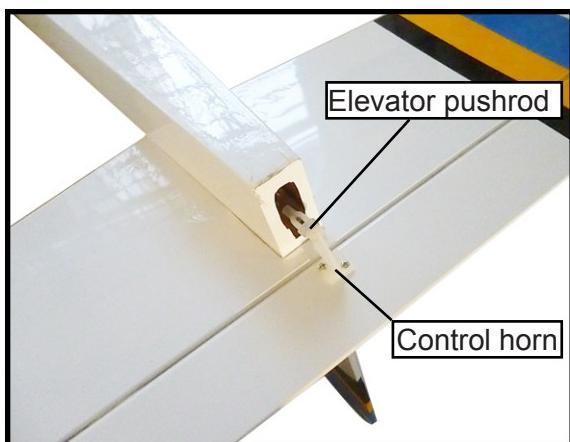
4) Mount the control horns then into the mounting backplates. Do not overtighten the screws or the backplates may crush the wood.

5) Position the rudder control horn on the left side of the airplane.

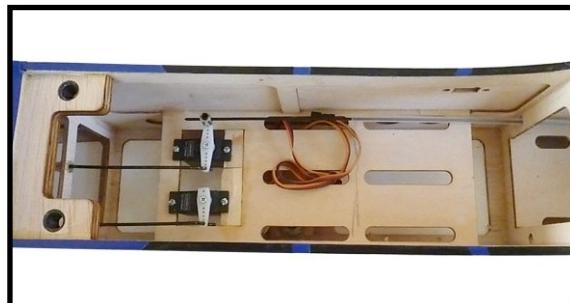
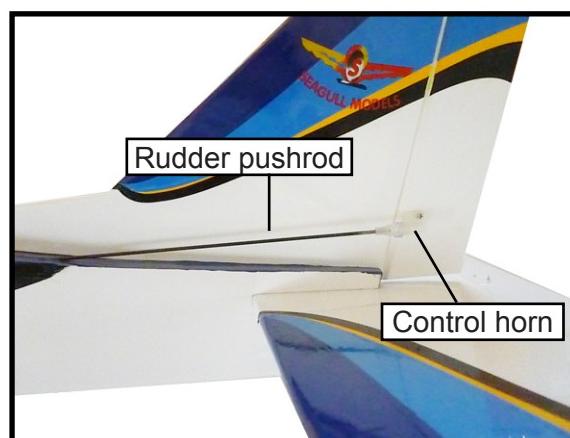
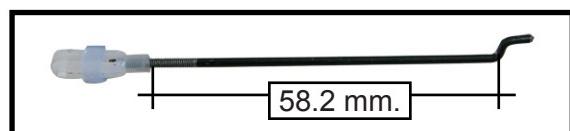
6) Install the rudder control horn using the same method as with the elevator control horns.



ELEVATOR PUSHROD INSTALLATION.

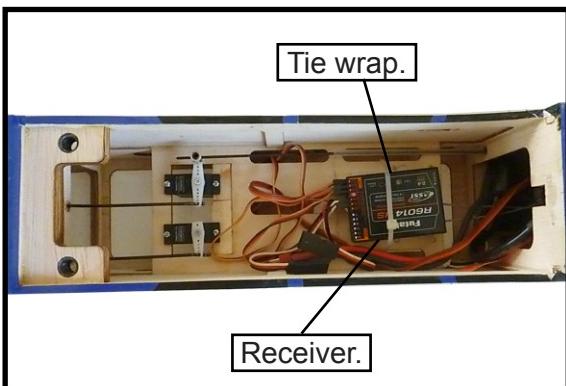


RUDDER PUSHROD INSTALLATION.

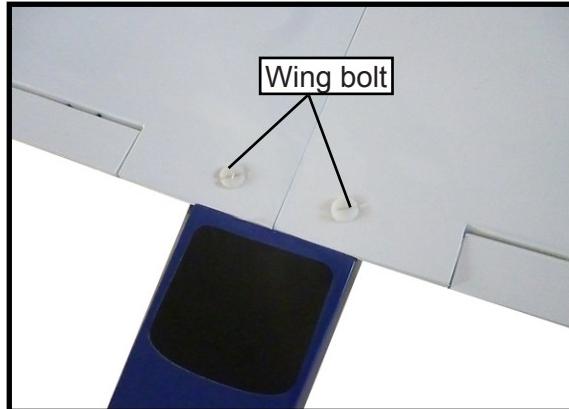


INSTALLING THE RECEIVER.

- 1) Plug the five servo leads and the switch lead into the receiver. Plug the battery pack lead into the switch also.
- 2) Wrap the receiver and battery pack in the protective foam rubber to protect them from vibration.
- 3) Route the antenna in the antenna tube inside the fuselage and secure it to the bottom of fuselage using a plastic tape.



ATTACHMENT WING-FUSELAGE.



BALANCING.

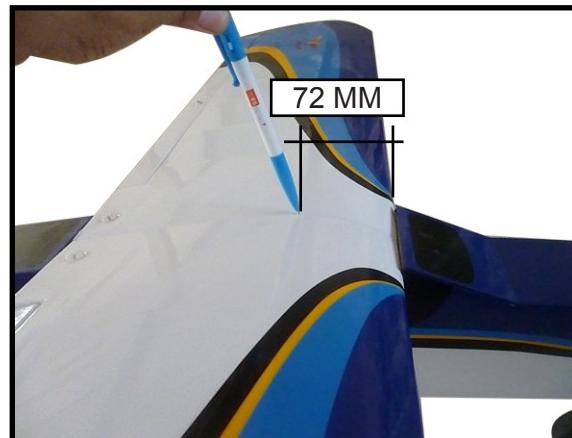
- 1) It is critical that your airplane be balanced correctly. Improper balance will cause your plane to lose control and crash. THE CENTER OF GRAVITY IS LOCATED 72MM BACK FROM THE LEADING EDGE OF THE WING AT THE WING ROOT.
- 2) Mount the wing to the fuselage. Using a couple of pieces of masking tape, place them on the top side of the wing 72mm back from the leading edge of the wing at the wing root.
- 3) Turn the airplane upside down. Place your fingers on the masking tape and carefully lift the plane .

Accurately mark the balance point on the top of the wing on both sides of the fuselage. The balance point is located 72mm back from the leading edge of the wing at the wing root. This is the balance point at which your model should balance for your first flights. Later, you may wish to experiment by shifting the balance up to 10mm forward or back to change the flying characteristics. Moving the balance forward may improve the smoothness and arrow-like tracking, but it may then require more speed for take off and make it more difficult to slow down for landing. Moving the balance aft makes the model more agile with a lighter and snappier "feel". In any case, please start at the location we recommend .

With the wing attached to the fuselage, all parts of the model installed (ready to fly), and empty fuel tanks, hold the model at the marked balance point with the stabilizer level.

Lift the model. If the tail drops when you lift, the model is "tail heavy" and you must add weight* to the nose. If the nose drops, it is "nose heavy" and you must add weight* to the tail to balance.

*If possible, first attempt to balance the model by changing the position of the receiver battery and receiver. If you are unable to obtain good balance by doing so, then it will be necessary to add weight to the nose or tail to achieve the proper balance point.



CONTROL THROWS.

Ailerons :

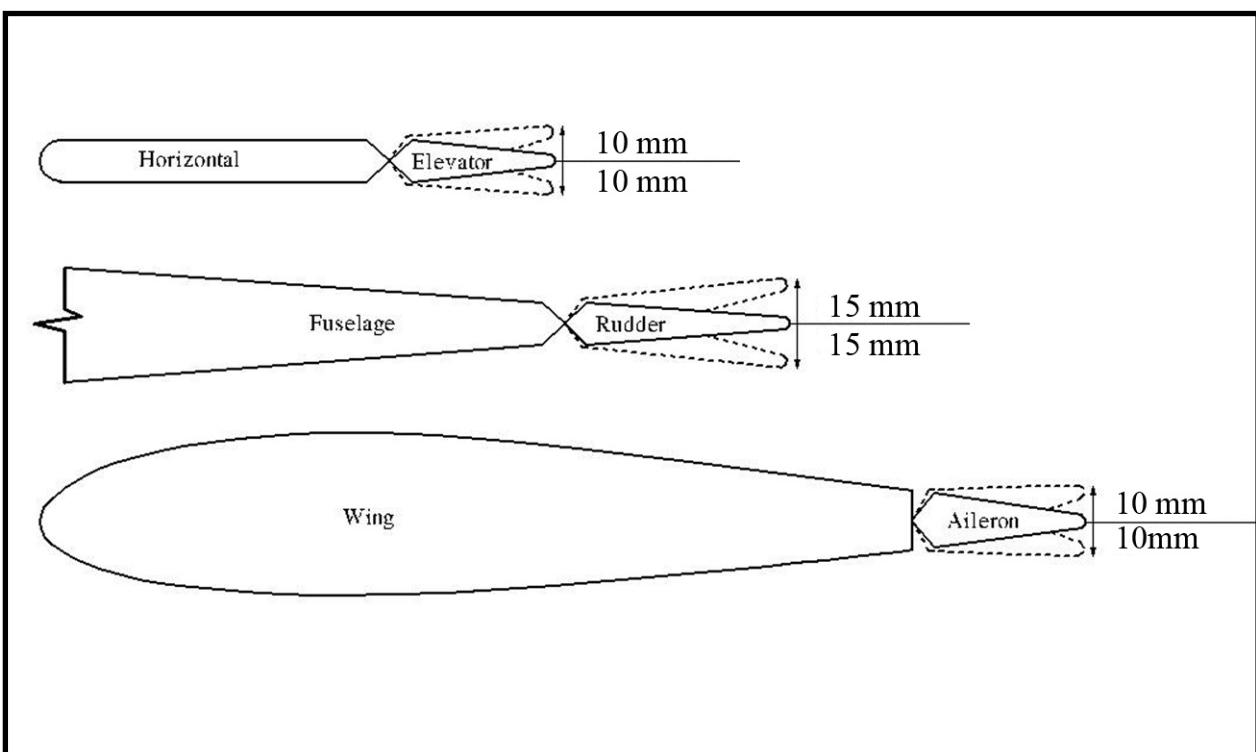
- Up : 10 mm
- Down : 10 mm

Elevator :

- Up : 10 mm
- Down : 10 mm

Rudder :

- Right : 15 mm
- Left : 15 mm



FLIGHT PREPARATION.

Check the operation and direction of the elevator, rudder, ailerons and throttle.

- A) Plug in your radio system per the manufacturer's instructions and turn everything on.
- B) Check the elevator first. Pull back on the elevator stick. The elevator halves should move up. If it does not, flip the servo reversing switch on your transmitter to change the direction.
- C) Check the rudder. Looking from behind the airplane, move the rudder stick to the right. The rudder should move to the right. If it does not, flip the servo reversing switch on your transmitter to change the direction.
- D) Check the throttle. Moving the throttle stick forward should open the carburetor barrel. If it does not, flip the servo reversing switch on your transmitter to change the direction.
- E) From behind the airplane, look at the aileron on the right wing half. Move the aileron stick to the right. The right aileron should move up and the other aileron should move down. If it does not, flip the servo reversing switch on your transmitter to change the direction.

PREFLIGHT CHECK.

- 1) Completely charge your transmitter and receiver batteries before your first day of flying.
- 2) Check every bolt and every glue joint in the **BOOMERANG EP** to ensure that everything is tight and well bonded.
- 3) Double check the balance of the airplane. Do this with the fuel tank empty.
- 4) Check the control surfaces. All should move in the correct direction and not bind in any way.
- 5) If your radio transmitter is equipped with dual rate switches double check that they are on the low rate setting for your first few flights.
- 6) Check to ensure the control surfaces are moving the proper amount for both low and high rate settings.
- 7) Check the receiver antenna. It should be fully extended and not coiled up inside the fuselage.
- 8) Properly balance the propeller. An out of balance propeller will cause excessive vibration which could lead to engine and/or airframe failure.

*We wish you many safe and enjoyable flights
with your BOOMERANG EP.*